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Jensen, Rasmus Lund; Brunsgaard, Camilla

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Rasmus Lund Jensen, Camilla Brunsgaard
Aalborg University, Department of Civil Engineering,
Sohngaardsholmsvej 57, 9000 Aalborg, Denmark,
Telephone: +45 9635 8551, Fax: +45 9814 2555, e-mail: rlj@civil.aau.dk
Working group 14

Question The demanded air change rate for dwellings given in the Danish building regulation is 0.5 h^{-1}. This is to ensure a good indoor air quality with an adequately low level of moisture. In many Passive Houses the air change rate is lower - down to 0.3 h^{-1}. Can the air change rate in a Danish Passive House be lowered in order to save energy without compromising the desired air quality?

Method By use of a detailed building simulation program taking energy, temperature, air quality and moisture into account the influence of several parameters on the necessary air change rate is investigated. Among others the influence of different weather condition (different level of moisture in the outdoor air), different use of the building (drying cloth indoor, recirculation of air from the exhaust hood) and the number of people per square metre is examined.

Contents A total of 27 annual simulations for three different geographical locations are compared. The energy use, air quality, thermal comfort, and indoor relative humidity are compared for the different air change rates.

Results From the simulations the necessary air change rate in a Danish passive house can be determined according to the use of the house ensuring a good indoor air quality and minimum energy consumption

Conclusions The required air change rate given in the Danish building regulations insures in all cases a good indoor air quality. In many situations it is possible to reduce the air change without compromising the air quality thereby reducing the energy consumption of the building.